



Dietary advice for people with **COELIAC DISEASE**

Key concepts

- A gluten-free diet is the first-line, lifelong treatment for coeliac disease
- A wide range of gluten-free foods are now available in supermarkets. It is important patients have a good understanding of gluten containing foods and ingredients and are able to interpret food labels
- There is a limited range of gluten-free foods available partly subsidised on prescription. The only advantage of obtaining these foods on prescription is a possible reduction in cost for the patient.
- Gluten-free foods on prescription are not different from, and not necessarily less expensive than, super market equivalents, when taking into account consultation and other fees

Diagnosis of coeliac disease

Coeliac disease is a chronic inflammatory condition of the small intestine in genetically susceptible people. It involves an immunological response to gluten, the major protein found in all varieties of wheat, rye and barley. A diagnosis of coeliac disease can easily be overlooked as symptoms vary in their severity and are often vague and non-specific. Typically symptoms include gastrointestinal disturbance (diarrhoea, constipation, nausea, cramping or distension), general and ongoing fatigue and weight loss, although some patients may be asymptomatic.^{1,2}

Coeliac disease should be considered as a possible diagnosis in patients with the following symptoms and signs:²

- Gastrointestinal symptoms including chronic or intermittent diarrhoea and persistent or unexplained nausea and vomiting
- Recurrent abdominal pain, cramping or distension
- Ongoing fatigue
- Weight loss particularly if sudden or unexpected
- Unexplained anaemia

Partially subsidised gluten-free foods

Currently, a number of gluten-free substitute foods are subsidised in the Pharmaceutical Schedule (i.e. flour, bread mix, baking mix and pasta) although none are fully funded. Since 1 April, 2011, the funding of gluten-free foods is no longer actively managed by PHARMAC (i.e. no access, product or subsidy changes will occur).

The use of these subsidised listings is very low and gluten-free substitutes are widely available through retail outlets and in some cases may be less expensive than obtaining the subsidised product. The price of prescription gluten-free foods varies between pharmacies depending on their mark-up. Prescriptions for these foods would be appropriate for people who would be financially disadvantaged by the retail purchase of gluten-free foods. Costs of consultation fees, prescription renewal fees and access to pharmacies licensed to dispense special foods, need to be taken into consideration.

Gluten-free grains, flours and products

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| Rice | All varieties of rice, rice bran, rice cakes* and crackers* rice flour and products* made from rice flour, e.g. rice pasta and noodles |
| Corn | Maize flour, polenta, corn chips* and crispbreads* |
| Other grains | Lentil flours, soy flour, potato flour, arrowroot, sago, tapioca, quinoa, buckwheat, millet, amaranth, psyllium |

* check flavourings for gluten content

There is an increased prevalence of coeliac disease in patients with type 1 diabetes, autoimmune thyroid disease and a number of other conditions.² Patients with a first degree relative with coeliac disease have a one in ten risk of testing positive for coeliac disease.²

Antibodies

Tissue transglutaminase (TTG) serology is the preferred initial test for people with suspected symptoms of coeliac disease and those who are at increased risk. In New Zealand, laboratories routinely test IgA in conjunction with TTG, to ensure a low TTG value is not the result of an underlying IgA deficiency.

While serology can indicate the likelihood of coeliac disease being present, the gold standard for diagnosis is a small bowel biopsy.

Both serological and biopsy screening should not occur if gluten has already been removed from the diet due to the increased likelihood of false negatives. Patients should be advised to resume consumption of a gluten containing diet for at least six weeks prior to testing.^{1,2}

Nutritional status of newly diagnosed people

At the time of diagnosis, some patients with coeliac disease may have substantial weight loss, anaemia and evidence of vitamin and mineral deficiencies. Nutritional status depends on the severity of gastrointestinal tract damage and the length of time that the person has lived with the active disease. Malabsorption of iron, zinc, folate, calcium and fat-soluble vitamins are common.^{1,2}

When people with coeliac disease eliminate foods containing gluten from their diet, normal absorption of nutrients is usually restored within a few months but may take up to two years in older adults. Recommended repletion doses of vitamin and minerals are individually based, however, many people with coeliac disease benefit from a calcium and vitamin D supplement.¹

Calcium and vitamin D malabsorption dramatically increases the risk of osteoporosis and osteomalacia in people with gluten-sensitive enteropathy. Most people with coeliac disease have some degree of osteopenia or osteoporosis. People who develop osteoporosis at a young age are usually advised to be tested for coeliac disease. Calcium and vitamin D supplementation, coupled with a strict gluten-free diet, usually results in re-mineralisation of the skeleton.^{3,4}

Iron and folate deficiencies are common in people first presenting with coeliac disease, as the site of absorption in the bowel is commonly involved in the inflammatory changes. Removal of gluten from the diet has been found to correct anaemias in the majority of people.¹ If, however, symptoms of tiredness and lethargy persist, dietary intake of foods rich in iron and folate should be reviewed and supplementation considered.¹

Secondary lactose intolerance

Many people with coeliac disease also have secondary lactose intolerance due to reduced enzyme production by the damaged villi. In the majority of people this resolves with the removal of gluten from the diet. People with lactose intolerance can present with gastrointestinal symptoms similar to those of coeliac disease. If symptoms persist after the removal of gluten, a lactose free trial should be considered and other food intolerances investigated. As lactose intolerance can resolve with repair of the villi, lactose containing foods should be re-trialled to ensure the diet is not unnecessarily restrictive and an adequate calcium intake is achieved.

Gluten free diets

People with coeliac disease must follow a lifelong gluten-free diet by excluding gluten containing grains and their derivatives. Oats are also generally avoided (see Page 18) This means that people with coeliac disease cannot eat most commercially available breads, cereals, biscuits, pastas and processed foods. For some people, adherence to a gluten-free diet is difficult. However eating gluten containing foods often results in an immediate return of gastrointestinal symptoms and increases

the risk of long-term health issues including osteoporosis, anaemia, an increased risk of infertility and miscarriage, as well as lymphoma and small bowel cancers.^{1,2}

People following a gluten-free diet can eat all non-carbohydrate food normally, however, it is important to read food labels as processed food, coatings, sauces and dressings may contain gluten. Most supermarkets and health food shops now sell a wide range of gluten-free products including non-wheat based flours and grains (Table 1).

Gluten-free or low-gluten

Internationally, different definitions of gluten restriction are used to define the treatment of coeliac disease. Food Standards Australia and New Zealand (FSANZ) define gluten-free foods as those that contain no detectable gluten, oats or oat products or malted cereals. FSANZ further defines low-gluten products as those that contain no more than 20 mg of gluten per 100 g of food.⁶ In contrast, the United States and Canada define gluten-free foods only as those derived from naturally gluten-free grains.⁵

There is some concern about the level of gluten contamination in gluten-free products and little agreement about what level of trace amounts of gluten are acceptable for people with coeliac disease. A low-gluten diet may be tolerated by some adults with coeliac disease. One study found that the residual gluten in low-gluten products is at a safe limit at usual consumption levels for adults with coeliac disease.⁷ Other researchers report resolution of gastrointestinal symptoms when patients moved from a low-gluten to a gluten-free diet.²

In New Zealand, a gluten-free diet, as defined by FSANZ, is recommended for children with coeliac disease. In general, the low-gluten recommendation is still used for older adults or for adults who have difficulty with the restriction of a gluten-free diet. However, if symptoms do not resolve it is worthwhile considering a trial of a gluten-free diet.

NB: Gluten-free diets should not be trialled without confirmation of the diagnosis of coeliac disease .

The role of oats in a gluten-free diet - has the evidence changed?

Although the addition of oats to a gluten-free diet has nutritional benefits and may introduce more variety in the diet, evidence for their use remains controversial.^{8,9} The main protein type in oats is different to the gluten found in wheat and other cereals, however, oats do contain smaller amounts of avenin, a protein which is similar to gluten.

Recent evidence suggests that a subgroup of people with coeliac disease are intolerant to pure oats and also that the amount of avenin and the degree to which an immune response is triggered varies between different cultivars of oats.^{8,9} This new research may help explain why earlier research into the safety of oats in people with coeliac disease has had contradictory results. Most studies have also differed in the type and purity of the oats used and in study size and design.

Contamination of oats and oat-containing products with gluten continues to be a problem for researchers and also for people who choose to include oats in their diet. Contamination may occur during planting, harvesting, transport and processing of oats. Many countries are now working to improve agricultural techniques and industrial processes so that an uncontaminated supply of oats and oat products are available.

Current advice in New Zealand (July 2010) recommends that the consumption of oats and oat containing products should be avoided by people with coeliac disease.¹⁰

“The safety of oats in individuals with coeliac disease has been extensively investigated. Some people with coeliac disease exhibit toxicity to oats. The Clinical Advisory Committee of the Coeliac Research Fund recommends that in Australia and New Zealand, oats should be excluded from a gluten free diet for people with coeliac disease.”

Despite this recommendation, it is also stated that in some circumstances the benefits of including oats in a gluten-free diet may outweigh the risk.¹⁰ For example, some patients with coeliac disease and poorly controlled type 1 diabetes may benefit from the inclusion of oats because of their low glycaemic index. Individual dietary preferences, enjoyment of food and the increased variability that the addition of oats allows should also be taken into account.

Most studies do show that the majority of people with coeliac disease can tolerate small amounts of oats as part of their gluten-free diet. The difficulty is identifying which people with coeliac disease are in the subgroup who do react to oats.

Appropriate guidance should be given to people who wish to include oats in their gluten-free diet. It is recommended that GPs and dietitians are involved in the decision.¹⁰ People with coeliac disease who wish to add oats to their diet should ensure that:

- They are aware that some people with coeliac disease may not tolerate oats (even if they are pure uncontaminated oats)¹¹
- If possible, only oats that are free from contamination with gluten should be eaten
- The amount of oats included in the diet is limited. Suggested intake of oats for an adult is 50-70 g per day (half to three quarters of a cup of dry rolled oats) and for a child, 20-25 g per day (one quarter cup of dry rolled oats).¹¹
- It has been recommended that in a newly diagnosed patient, oats are excluded from the diet for the first six to twelve months until the initial symptoms of coeliac disease have improved.¹² If after that time oats are introduced into the gluten-free diet, a return of symptoms may help identify people who react to oats
- GP follow-up should be ongoing



Ongoing monitoring and support

Gluten-free diets have been found to be deficient in a variety of micronutrients and dietary fibre due to the restrictive nature of the diet. Ongoing monitoring of calcium, iron, folate, zinc and fat soluble vitamin intake and status is recommended.¹ In addition, the risk of osteoporosis and osteopaenia should be considered and monitored appropriately. Referral to a dietitian experienced in managing coeliac disease is strongly recommended to ensure nutritional adequacy and detailed dietary education.


Further resources

The Manufactured Foods Database, compiled by Auckland City Hospital on behalf of the New Zealand Food Safety Authority, provides listings of manufactured foods available in New Zealand that are suitable for people with some common food allergies or intolerances including gluten intolerance.

www.mfd.co.nz

The Coeliac Society of New Zealand offers many resources on its website including a list of gluten-free cafes and restaurants throughout New Zealand (click on "Eating out").

www.coeliac.co.nz

 See www.bpac.org.nz Search term "coeliac" for various resources on the diagnosis and management of coeliac disease

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References

1. Niewinski M. Advances in coeliac disease and gluten-free diet. *J Am Diet Assoc.* 2008;108(4):661-72.
2. National Institute for Health and Clinical Excellence (NICE). Recognition and treatment of coeliac disease. NICE 2009. Available from: www.nice.org.uk. (Accessed Apr, 2011).
3. Valdimarsson T, Lofman O, Toss G, Strom M. Reversal of osteopenia with diet in adult coeliac disease. *Gut* 1996;38:322-7.
4. Sategna-Guidetti C, Grosso SB, Grosso S, et al. The effects of 1-year gluten withdrawal on bone mass, bone metabolism and nutritional status in newly-diagnosed adult coeliac disease patients. *Aliment Pharmacol Ther* 2000; 14:35-43.
5. Shepherd S, Gibson PR. Understanding the gluten-free diet for teaching in Australia. *Nutr Diet* 2006; 63: 155-65.
6. FSANZ. Food Standards Code. Chapter 1, Standard 1.2.8. Available from: www.foodstandards.gov.au/foodstandards/foodstandardscode.cfm (Accessed Apr, 2011).
7. Collin P, Thorell L, Kaukinen K, Mäki M. The safe threshold for gluten contamination in gluten-free products. Can trace amounts be accepted in the treatment of coeliac disease? *Aliment Pharmacol Ther* 2004;19(12):1277-8.
8. Comino I, Real A, de Lorenzo L, et al. Diversity in oat potential immunogenicity: basis for the selection of oat varieties with no toxicity in coeliac disease. *Gut* 2011;[Epub ahead of print].
9. Fric P, Gabrovská D, Nevala J. Celiac disease, gluten-free diet, and oats. *Nutr Rev* 2011; 69(2):107-15.
10. Coeliac Research Fund Position Statement. The consumption of pure oats by individual with coeliac disease. July 2010. Available from: www.coeliac.co.nz (Accessed May, 2011).
11. Rashid M, Butzner D, Burrows V. Consumption of pure oats by individuals with celiac disease: A position statement by the Canadian Celiac Association. *Can J Gastroenterol.* 2007;21(10):649-51.
12. Coeliac UK. Oats in the gluten-free diet. 2010. Available from: <http://www.coeliac.org.uk/healthcare-professionals/healthcare-professional-newsletters/october-hcp-exg> (Accessed May, 2011).